# Watermaker Manual

## For Electric / Generator-Driven Models G-20 & G-40

## Installation, Operation and Maintenance

401.400.2226 | info@seaclearwatermakers.com

36 Harrison Street, Bristol, RI 02809 | www.seaclearwatermakers.com

Version 1.1-G

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# Introduction

We'd like to thank you for selecting a Sea Clear Watermaker™ to supply fresh, pure water for your vessel and your crew. Because this system was designed specifically *for* cruisers *by* cruisers, we're confident that you will be happy with your choice.

It's important that you familiarize yourself with the watermaker and that you have a solid understanding of how it works. This manual will introduce you to the system and will walk you through its installation, operation and maintenance.

By taking proper care of your watermaker, you'll not only extend the life of your investment, but you should also be able to easily diagnose any issues that may arise.

If you have any questions about the installation, operation or maintenance of your Sea Clear Watermaker, please feel free to contact us any time.

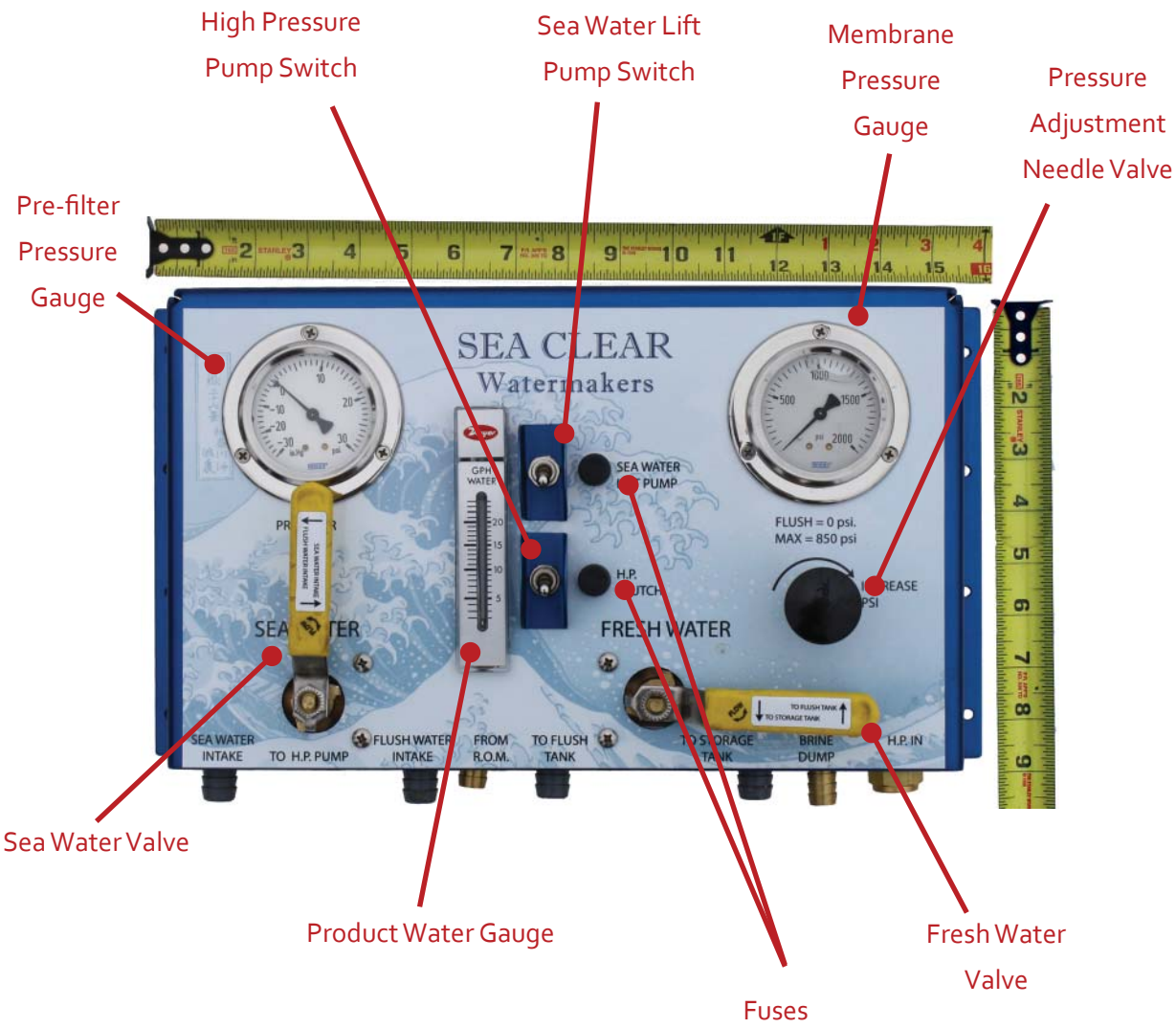
** Pump shown is for G-40 model.*


## Sea Clear Watermakers™

36 Harrison Street
Bristol, RI 02809
401.400.2226
info@seaclearwatermakers.com
www.seaclearwatermakers.com

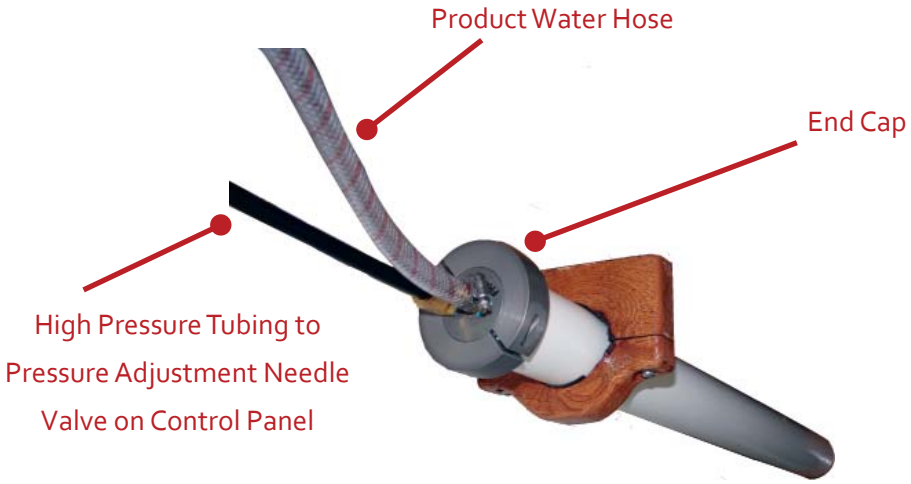
# Watermaker Diagrams

## Control Panel (Front)

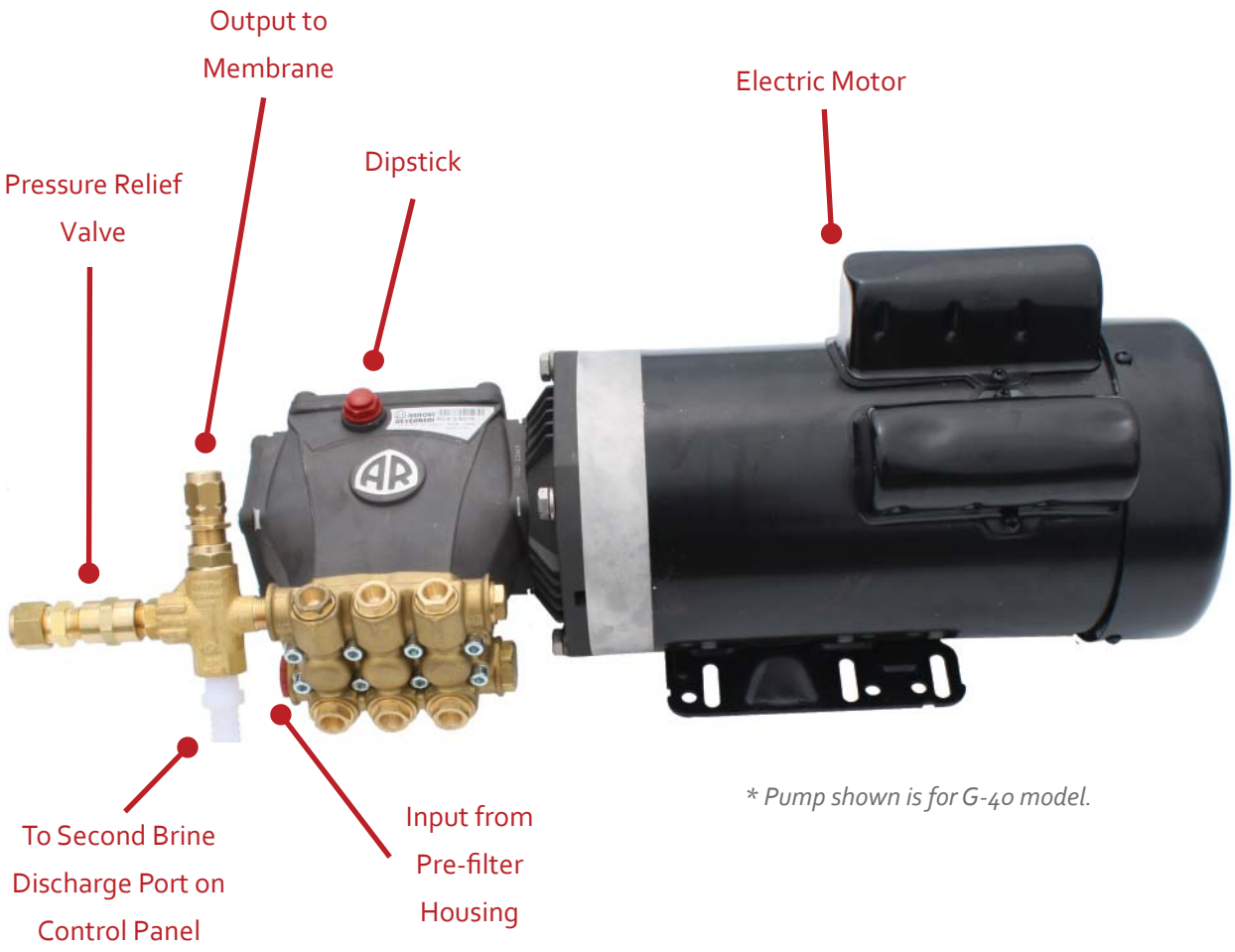


# Control Panel (Back)

## Membrane




## High Pressure Pump




** Pump shown is for G-40 model.*

# Operating Manual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# Quick Guide To Operation

1. Start generator, bringing it up to operating temperature and steady RPM

2. Turn Seawater valve to "Seawater intake" position

3. Turn Fresh Water valve to "Flush tank" position

4. Place hose labeled "To flush tank" into 5 gallon bucket

5. Turn Pressure Adjustment Needle Valve counterclockwise 2 times

6. Turn on Seawater Lift Pump

7. Turn on High Pressure Pump and let system run for 1 minute to purge air

8. Slowly turn Pressure Adjustment Needle Valve clockwise, increasing to operating pressure of 800 psi

9. When bucket is full and water ok, turn Fresh Water valve to "To storage tank" positionand set full bucket aside

10. Monitor Membrane pressure and level of water in tanks

11. When finished making water, slowly turn Pressure Adjustment Needle Valve counterclockwise until pressure drops to zero psi

12. Place "Flush water intake" hose into bucket of product water

13. Turn Seawater valve to "Flush water intake" position

14. Turn off Seawater Lift Pump

15. Let water flow through system until bucket is almost empty

16. Turn off High Pressure Pump

17. Return Seawater valve to "Seawater intake" position and Fresh Water valve to "To flush tank" position

# Starting Your Watermaker

## Before starting your watermaker:

- Oil, chlorine and other chemicals will do permanent damage to your watermaker membrane. Always confirm that your feed water source is free of chemicals before starting the system.

- If the watermaker has been in storage and this is the first start-up since pickling the unit, follow the normal start-up procedure, but discard all product water for the first 15 - 20 minutes of operation to ensure that the biocide solution has been completely flushed from the system. Ingestion of the solution will cause gastrointestinal issues.

1. Start your generator and let it warm up, adjusting it until it's running at a steady speed.

►►► Never run your generator above your maximum allowable generator speed. It's critical that the pressure of the membrane remain constant; because this is directly affected by your generator speed, do not vary the generator RPM while running your watermaker.

My maximum allowable generator speed:

_____ RPM

(Determined during installation; refer to chart on page 25 .)

2. When the generator has reached operating temperature, turn the Sea Water valve to the "Seawater Intake" position and turn the Fresh Water valve to the "Flush Tank" position. *(See Figure 1.)*

3. Place the hose labeled "To flush tank" into a clean 5 gallon bucket.

**Figure 1**

4. Turn the Pressure Adjustment Needle Valve counterclockwise 2 times to decrease pressure.

5. Turn on the Seawater Lift Pump using the switch on the panel labeled "Seawater Lift Pump."

6. Verify the following:
   - Water is running through the system and is being discharged overboard;
   - The Membrane Pressure Gauge on the right side of the panel indicates zero pressure;
   - The generator is still running smoothly at a steady speed

7. Start the High Pressure Pump by using the switch on the panel labeled "H.P. Clutch." You should see the flow of water through the system increase.

8. Let the watermaker run for a few minutes to clear any air from the system and to be sure that a steady flow of water is being discharged overboard.

9. Very slowly, turn the Pressure Adjustment Needle Valve on the panel in a clockwise direction until the pressure increases to 700 psi. Let the system stabilize. Product water should now be flowing into your bucket.

10. Verify that everything is running properly and that the pressure is being maintained at 700 psi. Now turn the Pressure Adjustment Needle Valve in a clockwise direction again to increase the pressure to its final rate (the actual pressure will depend upon water temperature, salinity, etc.).
    ▶ ▶ ▶ Never go above 850 psi.

Your watermaker output will vary based on the temperature and salinity of the sea water. The properties of the water will change based on temperature; the rule of thumb is the colder the water, the lower the output at a given pressure. The same is true for a higher salt content; in warmer climates, a higher output can be expected.

It is critical that the pressure remain constant at 800 PSI at all times. Do NOT increase the pressure to attempt to achieve a higher product output.

⓫ Let the bucket fill with water; while you're waiting, take a moment to do a routine check for any leaks in the system. When you are satisfied with the product water, turn the Fresh Water valve to the "To storage tank" position (valve should be vertical). Remove and coil the hose and put the full bucket aside for use during shut down.

⓬ Check the Membrane Pressure Gauge on the right side of the panel occasionally to verify that the pressure is constant.

⓭ Monitor the level of water in your tank. When the tank is full or when you are finished making water, proceed to the shut down process on the following page.

# Shutting Down Your Watermaker

1. When your tanks are full or you are finished making water, slowly turn the Pressure Adjustment Needle Valve counterclockwise. The pressure on the gauge above should decrease to zero PSI and the product water should stop flowing.

2. Turn the Fresh Water valve to the "Flush tank" position (valve should be horizontal), so that it's ready for the next time you make water.

Upon shut down, organic matter will remain in the system, which will cause microorganisms to grow that can clog/damage your membrane. Flushing the system with product water after shut down eliminates most organic matter and keeps your membrane clean.

►►► If your watermaker will be inactive for more than 7 days, the membrane must be pickled (see "Long Term Storage").

3. Put the hose labeled "Flush water intake" into the bucket of product water (set aside during start-up) and turn the Sea Water valve to the "Flush water intake" position (valve should be horizontal).

4. Turn off the Seawater Lift Pump using the switch on the panel labeled "Seawater Lift Pump."

5. The water will flow from the bucket back through the system; let it run until the bucket is almost empty.

6. Turn off the High Pressure Pump using the switch on the panel labeled "H.P. Clutch."

►►► Do not let the pump run dry for more than a few seconds as this will damage your system.

Never let the pump run dry and never turn off the Seawater Lift Pump while the High Pressure Pump is running and the Seawater valve is in the "Seawater Intake" position. When shutting down the system, always switch the Seawater valve to the "Flush water intake" position before turning off the Seawater Lift Pump.

# Long Term Storage

If you do not intend to use your watermaker again within the next 7 days (5 days in hotter climates), the watermaker should be pickled. Pickling introduces chemicals into the system to prevent the growth of microorganisms that will damage the membrane.

If the watermaker may be exposed to freezing temperatures, antifreeze must be introduced into the system. Please follow "Cold Weather Storage" procedure on the next page.

The pickling process will preserve the membrane for up to 6 months. If the watermaker will be inactive for longer durations, the pickling process must be repeated every 6 months.

1. Using the 5 gallons of product water made during start-up*, add 5 tablespoons of sodium metabisulfite to the bucket and mix until dissolved. (Sodium metabisulfite is readily available wherever you find beer brewing supplies.)

2. Put the hose labeled "Flush water intake" into the bucket and turn the Sea Water valve to the "Flush water intake" position (valve should be horizontal).

3. Turn off the Seawater Lift Pump using the switch on the panel labeled "Seawater Lift Pump."

4. The pickling solution will flow from the bucket back through the system. When the bucket is empty, let the watermaker run for an additional 5 seconds before shutting down.

5. Turn off the High Pressure Pump using the switch on the panel labeled "H.P. Clutch."

►►► Do not let the pump run dry for more than a few seconds; this will damage your system.

* If for any reason you are unable to operate the watermaker (e.g., during haul out) and you do not have 5 gallons of product water available, you may use clean tap water instead. However, the tap water must be run through a charcoal filter first to eliminate all chlorine, as this will damage your membrane.

# Cold Weather Storage

If the watermaker will be exposed to freezing temperatures, it is necessary to introduce antifreeze. Propylene glycol antifreeze (also known as RV antifreeze or potable water antifreeze) can be used for cold storage or storage up to 1 year.

1. Starting with the watermaker off, fill your 5 gallon bucket with propylene glycol antifreeze.

2. Put the hose labeled "Flush water intake" into the bucket and turn the Sea Water valve to the "Flush water intake" position (valve should be horizontal).

3. With the generator at operating RPM, turn on the High Pressure Pump by using the switch on the panel labeled "H.P. Clutch."

4. Watch the brine dump and turn off the High Pressure Pump as soon as you see antifreeze.

►►► Keep a close watch on the 5 gallon bucket to be sure it does not run dry.

►►► Depending upon Seawater Lift Pump installation, it may be necessary to drain water from hoses and lift pump before exposing to freezing temperatures.

# Maintenance Manual

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# Pre-filters

►►► Use only 5-micron 10" polyester filter elements, such as Katadyne 8012861. These can be found at most marine and water supply stores.

Pre-filters should be replaced regularly. To determine the status of your Pre-filter element, use the Pre-filter Pressure Gauge on the Control Panel. This gauge should stay at or above zero PSI when the system is in operation. If the gauge shows a negative pressure or a vacuum, it's time to replace the element.

## Replacement Procedure

1. Shut down the system and ensure that the Sea Water Lift Pump is OFF and through-hull is closed.
2. Unscrew the Pre-filter Housing and remove the Pre-filter element.
3. Discard the used element and install a new 5-micron polyester element.
4. Reassemble by securely screwing the Pre-filter Housing back together.
5. When restarting the system, be sure to check the Pre-filter Housing for leaks.

# High Pressure Pump

Your watermaker system includes an AR North America High Pressure Pump. Designed for long life, the pump should provide years of trouble-free operation if maintained and inspected regularly.

During installation, the gear case was filled with 9.81 oz. ISO 100 - NA 30 weight hydraulic oil and the bolts and belts were adjusted. It is good practice to inspect the belt and check the gear case oil every 20 hours of operation.

See the following pages for information regarding the electric motor.

## 1HP Electric Motor Datasheet (Standard Kit Model G-20)

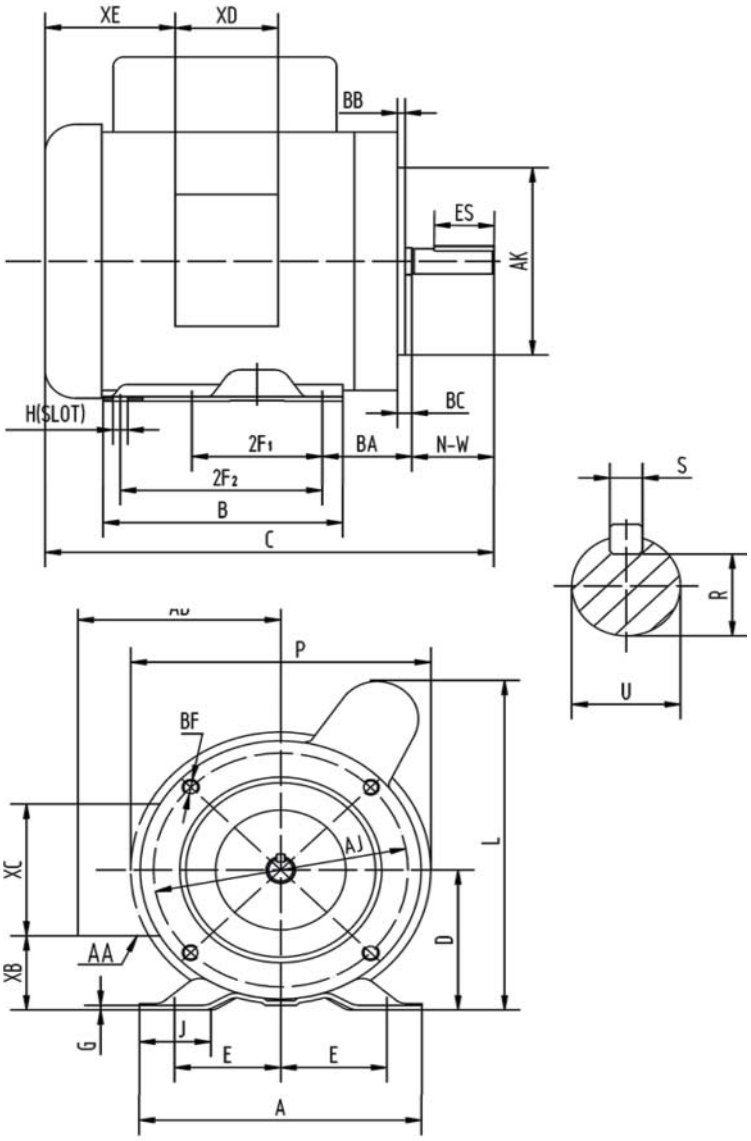
| | |
|---|---|
| Horsepower | 1 |
| RPM / poles | 1800 / 4 |
| Voltage / phase | 115 / 208-230V / 1 |
| Frame | 56C |
| Enclosure | TEFC |
| Frequency | 60Hz |
| Rated speed | 1725 RPM |
| Full load amps | 13.6 / 7.5 - 6.8 A |
| Duty cycle | Continuous |
| Service factor | 1.15 |
| Insulation class | F |
| Base type | C-Face - Removable |
| Shaft | Keyed |
| DE bearing | 6205 |
| ODE bearing | 6203 |
| Mounting | F1 |
| Rotation | Clockwise / Counterclockwise |
| Overload | Manual |
| Start capacitor | Ø42 x 80mm² / 300 uF / 125V |
| Run capacitor | --- |
| Wire type | Loose Wire |
| Wire housing | Junction Box |
| Connection diagram | 115 / 208 - 230V - 6 Lead |
| Approx. weight | 34 lbs. |
| FL efficiency | 68.0% |

## 1HP Electric Motor Dimensions (Standard Kit Model G-20)

* All dimensions are in inches.

| Mounting | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E | 2F1 | 2F2 | H | BA | A | B | C | D | G | J | L | P | AA | AB |
| 2.44 | 3 | 5 | 0.34 | 2.75 | 6.5 | 6.5 | 13.4 | 3.5 | 0.12 | 1.73 | 8.07 | 6.9 | 1/2 | 5.35 |

| | Key | | Keyseat | Flange | | | | Shaft | | Terminal Box | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BC | ES | S | R | AJ | AK | BB | BF | N-W | U | XB | XC | XD | XE |
| 0.19 | 1.41 | 0.188 | 0.517 | 5.875 | 4.5 | 0.16 | 3/8-16 | 1.88 | 0.625 | 1.65 | 3.7 | 3.23 | 285 |



## 2HP Electric Motor Datasheet (Premium Kit Model G-40)

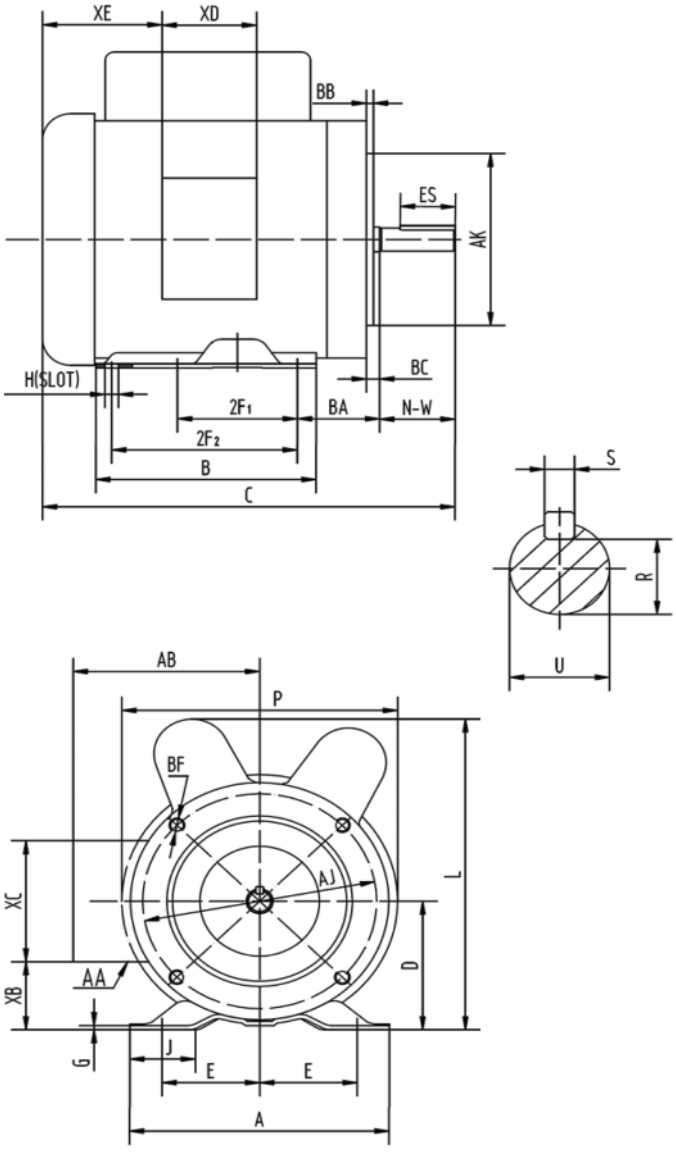
| | |
|---|---|
| Horsepower | 2 |
| RPM / poles | 1800 / 4 |
| Voltage / phase | 115 / 208-230V / 1 |
| Frame | 56C |
| Enclosure | TEFC |
| Frequency | 60Hz |
| Rated speed | 1725 RPM |
| Full load amps | 20.0 / 11.1 - 10.0 A |
| Duty cycle | Continuous |
| Service factor | 1.15 |
| Insulation class | F |
| Base type | C-Face - Removable |
| Shaft | Keyed |
| DE bearing | 6205 |
| ODE bearing | 6203 |
| Mounting | F1 |
| Rotation | Clockwise / Counterclockwise |
| Overload | Manual |
| Start capacitor | Ø42 x 80mm² / 400 uF / 165V |
| Run capacitor | Ø45 x 90mm² / 40 uF / 450V |
| Wire type | Loose Wire |
| Wire housing | Junction Box |
| Connection diagram | 115 / 208 - 230V - 6 Lead |
| Approx. weight | 43 lbs. |
| FL efficiency | 73.0% |

## 2HP Electric Motor Dimensions (Premium Kit Model G-40)

* All dimensions are in inches.

| Mounting | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E | 2F1 | 2F2 | H | BA | A | B | C | D | G | J | L | P | AA | AB |
| 2.44 | 3 | 5 | 0.34 | 2.75 | 6.5 | 6.5 | 14.88 | 3.5 | 0.12 | 1.73 | 8.5 | 6.9 | 1/2 | 5.35 |

| | Key | | Keyseat | Flange | | | | Shaft | | Terminal Box | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BC | ES | S | R | AJ | AK | BB | BF | N-W | U | XB | XC | XD | XE |
| 0.19 | 1.41 | 0.188 | 0.517 | 5.875 | 4.5 | 0.16 | 3/8-16 | 1.88 | 0.625 | 1.65 | 3.7 | 3.23 | 285 |



# Installation Manual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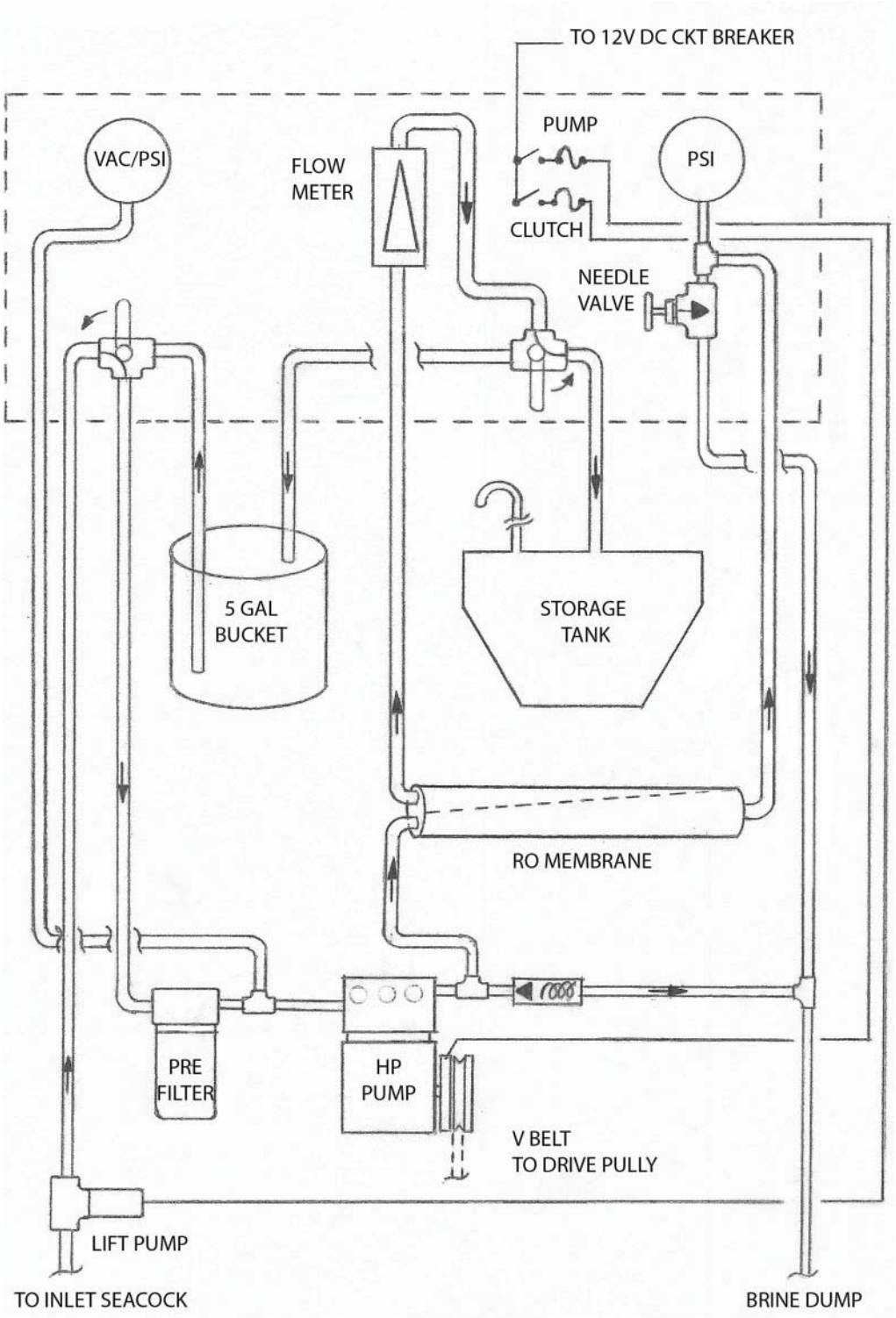
# System Diagram



# What's Included In Your Kit

*Standard Kit (Model G-20):*

- (1) 40" reverse osmosis membrane with housing
- (1) 1HP 115V/230V AC pump

*Premium Kit (Model G-40):*

- (2) 40" reverse osmosis membranes with housings
- (1) 2HP 115V/230V AC pump

*Both Standard & Premium Kits:*

- (1) Control panel
- (1) Seawater lift pump
- (1) Starter switch
- (1) Pre-filter housing with wrench
- (1) Pre-filter
- 25' of high pressure tubing
- 10' of 1/4" low pressure hose
- 50' of 1/2" low pressure hose
- 10' of 3/4" low pressure hose
- Sodium metabisulfite (pickling chemical)

## Optional Features

- Other membrane options
- Water tester
- Pump repair kit
- O-ring kit for membrane housing

## Items You Will Need

- Minimum 4000 watt generator (5000 watt preferred) or larger
- Intake through-hull
- Brine discharge through-hull
- Stainless steel hose clamps
- PVC cleaner and glue
- Membrane housing mounting brackets

# Control Panel Installation

►►► Prior to mounting the Control Panel, connect 1/4" hose to the Pre-filter Gauge on the back of the Control Panel. Leave the hose loose for connection to the Pre-filter Housing later.

1. Mount the Control Panel in a convenient location; the panel should be easily accessible and you should have a clear view of the gauges when you're running the watermaker. It should be as close as possible to the Membrane and to the High Pressure Pump.

►►► Make sure the panel is mounted securely to a solid surface.

On many boats, a convenient location for the Control Panel is a cockpit locker bulkhead. This provides easy access to controls and hose runs to the bucket are kept short.

2. Mount the Wiring Harness near the Control Panel (but <u>not below</u> the panel, as it will be obscured by hoses).

3. Run 12-gauge wire from a dedicated 10 amp breaker to the red wire on the barrier strip.

# Pre-filter Installation

The Pre-filter Housing should be located for easy access, away from any electronics or other surfaces that cannot get wet.

1. Mount the Pre-filter Housing to a bulkhead using the supplied bracket.

   ►►► Be sure to leave enough room below the housing to allow for Pre-filter changes.

2. Glue PVC fittings with PVC glue as required per your installation.

3. Run a 1/2" hose from the intake side of the Pre-filter Housing to the hose barb on the Control Panel labeled "To H.P. pump."

4. During the Control Panel installation, you attached a 1/4" hose to the back of the Control Panel and left it loose. Connect this hose to the 1/4" hose barb on the output side of the Pre-filter Housing.

5. Run a 1/2" hose from the output side of the Pre-filter Housing to the input hose barb on the High Pressure Pump.

6. Place the 5-micron Pre-filter that was included with your kit into the Pre-filter Housing. Screw the Pre-filter Housing back into place.

7. The first time the Seawater Lift Pump is started or when the Pre-filter is changed, you must release the air from the Pre-filter. Push and hold the red button on top of the Pre-filter Housing and turn on the Seawater Lift Pump. Continue to hold the button until air stops being released. As soon as water is seen, release the button.

# High Pressure Pump Installation

## Bracket Requirements

Before installing the high pressure pump, you'll need a bracket to mount it to the generator.

- The pump must be mounted as level as possible with the oil dipstick on top of the unit.
- The pump can be turned in either direction.
- The bracket should be made of mild steel and painted prior to installation.
- The bracket should include a method for tensioning the belt.

►►► It is recommended that a qualified metal fabricator or mechanic build and install the bracket.

| High Pressure Pump RPM | | |
|---|---|---|
| Minimum | Maximum | Recommended |
| 1250 | 1800 | 1725 |

**Decreasing the RPM of the pump will simply decrease the production of fresh water.*

To determine your generator's operating RPM, refer to the AR North America chart below.

►►► Go back to page 6 and write your generator's RPM in the gold-colored box for future reference..

NORTH AMERICA
First Choice When Quality Matters

## Pulley Speeds 1725 RPM Motor

| Pump | Motor Pulley OD | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pulley OD | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 3.75 | 4.00 | 4.25 | 4.50 | 4.75 | 5.00 | 5.25 | 5.50 | 5.75 | 6.00 | 6.50 | 7.00 | 8.00 | 9.00 | 10.00 |
| 7.00 | 584 | 648 | 713 | 778 | 843 | 907 | 973 | 1039 | 1102 | 1168 | 1231 | 1294 | 1355 | 1417 | 1500 | 1602 | 1725 | | | |

Once the pump has been mounted and the belt has been installed, you're ready to make the electrical and plumbing connections for the High Pressure Pump.

1. Fill the pump with 9.81 oz. ISO 100 - NA 30 weight hydraulic oil.

2. Connect the [+] wire from the magnetic clutch to the wiring harness on the Control Panel using 12-gauge tinned wire.

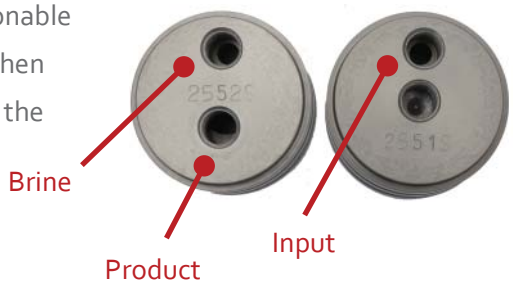
3. If the generator is not grounded to the [-] terminal of the battery, you will need to run an additional wire from the pump to your [-] battery buss. (In most cases, this will not be required.)

## High Pressure Pump Fittings

See "Swagelok High Pressure Fitting Installation" on page 29.

# Membrane Installation

The Membrane should be installed horizontally within a reasonable distance of the Control Panel and the High Pressure Pump. When selecting a location for the Membrane, be sure to account for the additional space required for hose fittings.




►►► The Membrane should not be near sources of heat, such as the generator or refrigeration.

The Membrane requires 2 mounting brackets. These brackets should be padded with rubber and should be firmly, but not too tightly, clamped around the high pressure vessel.

The membrane is shipped with plugs in the end caps where the hose fittings will be installed. Do not remove these plugs until you are prepared to install the hose. If the plugs are removed and the membrane is allowed to dry out, you will need to purchase a replacement membrane.

# Seawater Lift Pump Installation

The Seawater Lift Pump may be installed on a bulkhead with the bracket that was included with your watermaker or it may be threaded directly onto the through-hull fitting. If you are mounting it on a bulkhead, the pump must be installed a minimum of 2" below the waterline, as close to the through-hull as possible.

1. Once the pump has been mounted, run the brown wire to the wiring harness on the panel and run the black wire to the [-] buss.

2. Run a 3/4" hose from the output of the Seawater Lift Pump to the hose barb on the panel labeled "Seawater Intake." Secure using stainless steel hose clamps.

# Running Tubing and Hoses

## High Pressure Tubing

Your watermaker comes with 25' of high pressure tubing and 4 Swagelok field-attachable fittings. If your installation will require more than 25' of tubing, please contact us.

When planning your installation and high pressure tubing runs, be aware that the maximum bend radius for the tubing is 12".

►►► When running high pressure tubing in bilges or near heat sources, it is recommended that you install 3/4" reinforced hose over the high pressure tubing.

►►► While running tubing, you may use a heat gun to assist in bending it. However, be very careful not to overheat an area and crimp the tubing.

1. Once you've identified where the tubing will be run, start by running the high pressure tubing from the output port on the High Pressure Pump to the inlet port on the membrane *(see Figure 2)*. Be sure when cutting the tubing to length to leave some extra. Install end fittings per the "Swagelok High Pressure Fitting Installation" instructions.

**Figure 2**

►►► When cutting the tubing make sure the ends are square and clean. A plastic tubing cutter with scoring action, which can be found in most hardware stores, is recommended. This tool can be used to cut PVC tubing as well. Do not use a hacksaw.

❷ Blow the tubing clear to eliminate any chips or dust created by cutting.

❸ Once you've installed ends fittings on the high pressure tubing, connect tubing to the High Pressure Pump and Membrane using Teflon tape to seal the threads.

❹ Install the high pressure tubing from the Membrane to the port on the Control Panel labeled "H.P. In." Install end fittings per the "Swagelok High Pressure Fitting Installation" instructions. Connect and tighten fittings.

## Swagelok High Pressure Fitting Installation

❶ Fully insert the tube into the fitting and against the shoulder; rotate the nut finger-tight. Fig. 1.
**High-Pressure Applications and High Safety-Factor Systems:**
Further tighten the nut until the tube will not turn by hand or move axially in the fitting.

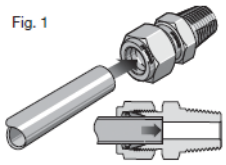


Fig. 1

❷ Mark the nut at the 6 o'clock position. Fig. 2.

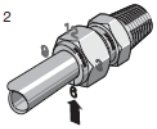


Fig. 2

❸ While holding the fitting body steady, tighten the nut one and one quarter turns to the 9 o'clock position. Fig. 3. Note: For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut three-quarters turn to the 3 o'clock position.

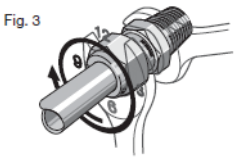


Fig. 3

## Low Pressure Hose

1. Install a 1/2" hose run from the output of the Pre-filter Housing to the inlet of the High Pressure Pump, securing with hose clamps.

2. Install a 1/2" hose run from the Brine Dump port on the Control Panel to the through-hull.

3. Install a second hose run from the second Brine Dump port on the Control Panel to the pressure relief valve located on the High Pressure Pump.

Though it may be necessary to "T" into another drain for the Brine discharge, it is preferable that a new through-hull be installed specifically for the watermaker. This through-hull should be located above the waterline and in a spot where flow can be verified from on deck.

### Product Water Hose

Install a 1/2" hose run from the product port on the Membrane *(see Figure 2 on page 28)* to the port on the Control Panel labeled "From R.O.M." and secure with hose clamps.

- Because it is important that the product water line never become blocked, we discourage the use of shut-off valves in the product water tubing.

- We recommend that the product water from your watermaker be connected to its own fill on your water tank. However, as we understand this is not always possible and because all installations are different, any solution that will not block the flow of water is acceptable.

## Through-Hull (not supplied)

The boat's designated intake through-hull should be located in an area that will always be in the water when the boat is used under normal running conditions. This through-hull must not be located near discharge lines that could introduce foreign materials, such as head or generator exhaust.

# Initial System Start-up

Now that you have completed installation, you are almost ready to start the watermaker for the first time.

**Pre Start-up Checklist**

- ☐ All hose fittings are secured with hose clamps.
- ☐ Through-hulls are open.
- ☐ All wiring connections are secure.
- ☐ Breaker is on.
- ☐ Belt tension on High Pressure Pump is adjusted.
- ☐ Verify Pressure Adjustment Needle Valve is turned counterclockwise to reduce pressure.
- ☐ Purge Pre-filter of air by pushing and holding the red button on top of the Pre-filter Housing and turning on the Seawater Lift Pump. Continue to hold the button until air stops being released; as soon as water is seen, release the button.

1. Starting with the Seawater valve in the "Seawater Intake" position and the Fresh Water valve in the "To Flush Tank" position, place the hose labeled "To flush tank" into a clean 5 gallon bucket.

2. Start the generator and bring it to operating temperature and RPM.

3. Turn on the Seawater Lift Pump using the switch on the Control Panel labeled "Seawater Lift Pump."

4. Verify water is flowing out the Brine Dump through-hull.

►►► Take a moment to check for leaks.

5. Turn on the High Pressure Pump using the switch on the Control Panel labeled "H.P. Clutch."

6. Take a moment to check for leaks again and verify additional flow through the system.

7. Let the system run for 5 minutes and then increase the pressure by turning the Pressure Adjustment Needle Valve clockwise until it reaches 700 psi.

8. Do another quick check for leaks.

## Setting The Pressure Relief Valve

**WARNING:** Be sure that the High Pressure Pump needle valve is turned fully counterclockwise to the minimum PSI.

1. Slowly increase pressure to 950 psi by turning the Pressure Adjustment Needle Valve on the Control Panel clockwise.

2. Using an Allen wrench, adjust the pressure relief valve until it opens. You should see water flow into the clear bypass hose and a slight drop in pressure on the Membrane Pressure Gauge.

3. Reduce pressure by turning the Pressure Adjustment Needle Valve counterclockwise to operating pressure of 850 psi.

4. Verify output flow to 5 gallon bucket.

5. Let system operate, discarding water for 15 minutes before testing, checking one last time for leaks.

6. At the end of 15 minutes, fill 5 gallon bucket with product water.

# Appendices

**High Pressure Pump Repair ..... Page 36**

**Troubleshooting Guide ..... Page 37**

# High Pressure Pump Repair

For more information about the High Pressure Pump, please visit http://www.arnorthamerica.com.

# Troubleshooting Guide

| Problem | Solution |
|---|---|
| Seawater Lift Pump will not start | • Check fuse in Control Panel<br>• Check wiring<br>• Make sure through-hull is clear of debris<br>• Make sure air has been purged from Pre-filter |
| High Pressure Pump will not engage | • Check fuse in Control Panel<br>• Verify wiring<br>• Check belt |
| No/low product water output | • Run system unpressurized for 15 - 30 minutes<br>• Check operating pressure |
| Poor quality/high salinity product water | • Check O-ring seal<br>• Replace Membrane |
| Product water smells bad | • Check Pre-filter<br>• Run system unpressurized for 15 minutes |
| High pressure fittings are leaking | • Remove fittings and apply thread sealant |
| Unable to obtain pressure | • Check all hose connections<br>• Make sure air is purged from Pre-filter<br>• Check Pre-filter gauge<br>• Replace needle valve |

| | |
|---|---|
| Water is flowing into High Pressure Pump but not out | • Check valves in High Pressure Pump<br>• Refer to High Pressure Pump Repair on page 34 |
| Pre-filter pressure drops below zero | • Change Pre-filter |
| No water flow through system | • Verify that through-hull is open<br>• Make sure Seawater valve on Control Panel is in the "Seawater intake" position<br>• Check Pre-filter<br>• Verify that Seawater Lift Pump is working<br>• Make sure brine discharge is not blocked<br>• Check all hose connections |

If you are still having difficulty with your watermaker, please contact us at (401) 400-2226 or info@seaclearwatermakers.com.